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370/214, 480, 203
208

375/146, 147

WHAT IS CLAIMED IS:

1. A band-division demodulation method in which a transmission band of a received RF signal is band-divided into a plurality, each of signals ^{cf} said band-divided is ^{into a plurality} OFDM-demodulated, and said demodulation results are synthesized, wherein the received RF signal is in-phase-distributed to said band division number, the band width that the entire band width of said received RF signal is divided by said band division number is used as a unit band width, each signal ~~said distributed so as to be shifted stepwise by~~ integral times of said unit band width is frequency-converted, ~~each signal~~ ^{each} said frequency-converted is allowed to band-pass by filtering with the same characteristics to perform a band division, and said ^{each} signal allowed to band-pass is OFDM-demodulated. see fs

2. An OFDM receiver in which a transmission band of a received RF signal is band-divided into a plurality, each of signals ^{cf} said band-divided is OFDM-demodulated, and said demodulation results are synthesized, comprising:

a distribution section for receiving ^{such} an RF signal and in-phase-distributing it to said band division number;

a frequency conversion section for using, as a unit band width, the band width ^{such} that the entire band width of said received RF signal is divided by said band division number, and frequency-converting each signal said distributed so as

to be shifted stepwise by integral times of said unit band width;

a band-pass filter section for allowing each signal said frequency-converted to band-pass with the same characteristics;

an OFDM demodulation section for OFDM-demodulating said ^{each} signal allowed to band-pass; and

a synthesizing section for synthesizing an output from said OFDM demodulation section to output demodulated data.

3. The OFDM receiver according to claim 2, wherein said band-pass filter section is a band-pass filter section of the same characteristics for allowing a frequency band that each signal [↓] said frequency-converted has in common.

4. An OFDM receiver in which a transmission band of a received RF signal is band-divided into a plurality, each of signals ^{of} said band-divided is OFDM-demodulated, and said demodulation results are synthesized, comprising:

^{60MHz priority of}
a first frequency conversion section for receiving ^{said} an RF signal and converting it into a first IF frequency band;

^{OFDM priority of}
an AGC section for adjusting an output signal from said first frequency conversion section to a certain constant output level and outputting it;

an in-phase distributor for in-phase-distributing an

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output from said AGC section into said band width division
number;

a second frequency conversion section for using, as
a unit band width, the band width that the entire band width
of said received RF signal is divided by said band division
number, and frequency-converting each output from said in-
phase distributor so as to be shifted stepwise by integral
times of said unit band width;

a band-pass filter section for allowing each signal
said frequency-converted to band-pass with the same
characteristics;

a third frequency conversion section for frequency-
converting said each band-pass signal into a second IF
frequency band;

an OFDM demodulation section for OFDM-demodulating
an output from said third frequency conversion section; and

a P/S section for parallel-to-series-converting and
synthesizing an output from said each OFDM demodulation
section.

5. An OFDM receiver in which a transmission band of
a received RF signal is band-divided into a plurality, each
of signals said band-divided is OFDM-demodulated, and said
demodulation results are synthesized, comprising:

an AGC section for receiving an RF signal, adjusting
it to a certain constant output level, and outputting it;

an in-phase distributor for in-phase-distributing an

output from said AGC section into said band width division number;

5 a ^{4th} fourth frequency conversion section for frequency-converting each output from said in-phase distributor, using, as a unit band width, the band width that the entire band width of said received RF signal is divided by said band division number, and frequency-converting each output from said in-phase distributor so as to be shifted stepwise by integral times of said unit band width;

10 a band-pass filter section for allowing each signal said frequency-converted to band-pass with the same characteristics;

15 a ^{5th} fifth frequency conversion section for frequency-converting said each band-pass signal into a second IF frequency band;

an OFDM demodulation section for OFDM-demodulating an output from said fifth frequency conversion section; and

20 a P/S section for parallel-to-series-converting and synthesizing an output from said each OFDM demodulation section.

25 6. An OFDM receiver in which a transmission band of a received RF signal is band-divided into a plurality, each of signals said band-divided is OFDM-demodulated, and said demodulation results are synthesized, comprising:

an AGC section for receiving an RF signal, adjusting it to a certain constant output level, and outputting it;

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an in-phase distributor for in-phase-distributing an output from said AGC section into said band width division number;

5 a fourth frequency conversion section for frequency-converting each output from said in-phase distributor, using, as a unit band width, the band width that the entire band width of said received RF signal is divided by said band division number, and frequency-converting each output from said in-phase distributor so as to be shifted stepwise by integral times of said unit band width;

a band-pass filter section for allowing each signal said frequency-converted to band-pass with the same characteristics;

10 an OFDM demodulation section for inputting an output from said band-pass filter section, under-sampling it by a frequency lower than a usual sampling frequency in accordance with the frequency of said input signal to convert it into a digital signal, and OFDM-demodulating it; and

15 a P/S section for parallel-to-series-converting and synthesizing an output from said each OFDM demodulation section.

20 7. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

25 wherein said receiver is the OFDM receiver according

to claim 2.

8. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according to claim 3.

9. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according to claim 4.

10. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according to claim 5.

11. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according to claim 6.

12. A multi-carrier transmission system having a transmitter for OFDM-modulating and transmitting a transmission signal, and a receiver for receiving and OFDM-demodulating said radio transmission signal,

wherein said receiver is the OFDM receiver according to claim 7.

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ABSTRACT OF THE DISCLOSURE

The present invention provides a band-division demodulation method and an OFDM receiver in which, by equalizing the characteristics of band-pass filters for parallel processing by band division, the development costs of the band-pass filters can be relieved and it can be constructed economically. They are the band-division demodulation method and the OFDM receiver in which an RF signal is in-phase-distributed in an in-phase distributor into a band division number, in local oscillators and a frequency conversion section, the band width that the entire band width of the received RF signal is divided by the band division number is used as a unit band width, and each signal distributed so as to be shifted stepwise by integral times of the unit band width is frequency-converted, and each signal frequency-converted is allowed in BPF to band-pass with the same characteristics, and then OFDM-demodulated in an OFDM demodulation section.